Monograph on Grading for Universities

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NEW DELHI

MONOGRAPH ON GRADING FOR UNIVERSITIES

INTRODUCTION

The suggestion that we should have the grade system instead of the present marking system (UGC—Examination Reform Plan 73)[1] is based on a number of important considerations and valid criteria. Some of these are:

(a) The results, percent marks or grades should indicate as accurately as possible the level of academic achievement of the students who are marked. (ACCURACY)

(b) The meaning of the marks or grades should be clear, to students and to others who are concerned about their standing. (These others include teachers, parents and those who may make decisions about a student's eligibility for employment or for post-graduate study). (FAMILIARITY)

(c) It should be reasonably easy to calculate the marks or grades without a need to use expensive equipment or elaborate statistical procedures. (SIMPLICITY)

In the marking system that obtains in Indian undergraduate university examinations using numerical marks, students are marked on each examination paper on a scale from 0 to 100, though the full scale is seldom used. Every student's obtained mark should be a measure of the quality of his answers. At the same time, a student's mark on different papers are combined to give his aggregate mark for all of his subjects. Very often an evaluation (as distinct from a measurement) is applied to the aggregate mark. If this aggregate is as high as 60% (very often this) of the possible total, the student is said to be in the First division; otherwise his mark is in the Second or Third division or he has failed.

Let us try to judge this marking system with the three criteria mentioned above.

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[1] University Grants Commission, Examination Reform-A plan of action. May 1973, pp 3-4.

1.1 Accuracy

On the first criterion, it fails miserably. This numerical marking system provides a very *inaccurate measurement*. Even though there are many reasons, a few can be given now :

1. The standards of examiners differ widely. The experience of examiners would tell that this is very likely while Research proves that it is a fact. It is found from Research that judgements of examiners are significantly different even when they are marking equivalent sets of answer books-even when different equally competent examiners have marked the same individual answer book.[2]

It is definite that we want a student's mark to depend on the quality of his answers more than it depends on which examiner happened to mark his answers. If we want to persist with percentage numerical marks and if we want this goal also to be realised, it is necessary to scale the marks of examiners to a common standard. Scaling can be done in a variety of ways. Appendix A shows some of the ways. Those that are worthy of consideration by this group will be what are familiarly known as Gauhati Method[3] and Dandekar Method.[4]

An alternative will be to award grades rather than numerical marks:

2. Examiners very frequently by indulging in Evaluation as well as measurement, distort the results. They make decisions as to who

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[2] Harper, A. E. Jr. "Ninety-Marking Ten-A study of Examinations". Indian Educational Review Vol. 2, 1967, pp 26-41.

Taylor H. J. "An Examination of Examiners". Journal of Education and Psychology Vol. 21, 1963, pp 15-25.

Natarajan, V. "Reliable marking of Tutorial, Laboratory Work and Drawing of Polytechnic Students". Journal of Nachimuthu Polytechnic, 1975 (under publication).

Natarajan, V. "An exercise in Marking". Workshop on Evaluation for College Teachers, 1975, AIACHE.

[3] Taylor, H. J. "Operation Passmark". Gauhati University, 1963.

Misra, V. S. "A study of the effect of Randomisation and Scaling on the errors in Examination Marks. Gauhati University, 1969.

[4] Dandekar, V. M. "Statistical Reform of the System of Evaluating Results of Mass conducted Examinations". Indian Educational Review, Vol. 3, 1968, pp 1-19.

Natarajan, V. "Evaluation of Examination Scores". Technical Teachers, Madras, 1973.

should pass and who should fail. If the passing mark is 35, they give an unusual number of marks of 35 and very few (perhaps not any) marks of 34 or 33. Similar "bunching" may be found at the minimum marks for first and second divisions. This can be avoided in grading system.

3. It is a matter of common experience that in some subjects like Mathematics, the highest mark awarded may be 100 and the lowest 0 or close to 0. In many other subjects this never happens. The highest mark for instance may be 70 and the lowest mark 20. Thus for what is considered to a 100 mark paper, the actual range of marks is only 50. When the marks of different papers are added, the subject in which a wide range of marks is used has *more effect* on the total result than does the subject with a narrow range. For example, we combine marks in two subjects say Chemistry and Mathematics; if marks in Chemistry range from 30 to 60 while marks in Mathematics vary from 50 to 95, the result will be that Mathematics will receive three times the weight of Chemistry. In effect, we shall be evaluating the performance of the student on his Mathematics rather than his Chemistry. This will *certainly lead* to a *great deal of irrationality*, in the choice of subjects or papers and in regard to the time given by a student to the study of particular subjects or papers. There are two alternatives; one is to scale the marks to a common standard; distinctly the other (I consider it better) is to use grades in the place of marks.[6] Summing up, the consideration of accuracy of the result will lead us to award *grades* rather than Numerical marks.

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[6] University Grants Commission. Recommendations of Zonal Workshops on Examination Reform, a follow up study of the Plan of Action, 1975, pp 6-7.

1.2 Familiarity

In terms of this, much can be said in favour of the percent numerical marking system. Ruch[7] criticises the numerical marking system on the ground that it implies a precision that is seldom attainable. Hill[8] observes: "The present percent marking system is familiar to teachers, students, employers and the public; and all of them think they know what it means; the trouble is that too much of what they know is not true. The marking scale is highly misleading. Marks are not though they appear to be, awarded on an absolute scale; for there is no absolute scale". The numerical marking system is looked upon as a fixed and dependable standard, which it is not. Supposing three students obtain 60, 59 and 55 marks respectively in a particular paper. Everyone of us is bound to interpret that one who obtained 60 marks is better than the one who got 59 but certainly much better than the third who got 55. The university goes so far as to place one of these students in the First division and the other two in the Second division. There are two major assumptions here: (1) The marking scale is absolute; and (2) The marks are free of error. Neither of these, is justified.

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[7] Ruch, G. M. The objective or New type Examination, Chicago, Scott and Foreman Co.

A student's mark has a real meaning only as a number to compare with numbers assigned to other students. These numbers are only *estimates* and they are subject to considerable error. Appendix B gives different sources of error in our examinations.

H. J. Taylor making calculations for many university examinations, has said that for examinations in India, this probable error in marking is normally about 5 and often as high as seven. The UGC reports in "Examination Reform—A Plan of Action, 1975" that "for some typical papers set at universities, experts have carried out a statistical analysis. Such a statistical analysis has shown that when an examiner assigns a mark to a script, there is a 50% chance that his error is greater than 5%. This means that where a candidate is awarded a raw mark of 41, the true mark may be either above 46 or below 36 in 50% of the cases. Under these circumstances the 101 point scale where candidates are distinguished in steps of one mark, loses all its significance". If then we consider our three students whose marks are 60, 59 and 55, for one who got 60, his true mark should be between 55 and 65 and that range includes, the true marks of all three students.

Since the advantage of familiarity is offset by serious misconceptions, in the case of numerical marks, we must go in favour of Grades.

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8. Walker H. Hill. Marking, Scaling and Grading, "Improvement of Examinations", University of Calicut, 1972, Cap. 10.

1.3 Simplicity

The present marking system is very simple, it is so simple that the marks of examiners are used for comparison when they are not comparable; they are not scaled; (when they should be) raw scores in different subjects are added, when they should not be. To say the truth, the numerical marking system is rendered simple at the expense of all these safeguards.

In University examinations as some pioneers have done (Gauhati), scaling of marks should have been adopted. Instead of depending too much on human labour (to again make it simple), some of the work of recording, checking, tabulating and scaling could be done by machine and in India, such equipment is available with universities.

If we adopt grades (a sound grading system) in the place of marks, most of the things mentioned above are taken care of. But then the question of how to award grades, interpret grades and add grades will have to be taken up and this could be done by looking at two distinct things namely, "a technical proposal for awarding grades to answer papers 'and' introducing grading, its problems and solutions."

2.0 FROM MARKS TO GRADES

It is not at all proposed that we should abandon marks as such. Marks are useful but they are just misused. While numerical marks can be the beginning of the marking procedure, it should not at all be the end. The scientific and practical way to look at it is, that examiners should mark papers just as they have been doing but then the final report of the results should *not* be in the form of numerical marks. There are several procedures. One such would be somewhat like this:

Answer books that are to be marked should be throughly randomised. This will ensure that all examiners will be marking sets of answer books that are equivalent in quality. Each examiner has both good and bad ones and each set (or bundle) is no better or worse than any other. In such a case, we can be reasonably sure that differences in the marks of examiners may be attributed to their different standards of marking, not to differences in the abilities of students. Also the identity of the student and of his college should be removed from each answer book. Very often it happens that one examiner marks his papers from a high mark of 80 to a low mark of 30 while another marks his from 60 to 20-such a difference is quite common-it is unfair to students to report the marks given by these two examiners as such. The unfairness must be eliminated by scaling the marks to a common standard. The difference between one examiner's 80 and the other's 60 becomes unimportant. They would agree in this that these are the best papers and that is exactly what we *need to know*.

Therefore, marks are important *only for* determining the rank order of the students. This is the function of the examiner, *this and no other*. In an university set up, the functions of examiners in a particular subject paper should be:

(a) to determine the relative quality of answers, to decide how the students' papers should be ranked in order of merit.

(b) to *leave* the determination of final mark for the student to the *university*.

(c) to again *leave* the decision in respect of pass or fail of a student to be made by the *university*.

Two important things are randomising answer books and scaling marks. For randomising, the Gauhati method is recommended. For scaling, the method described by Prof. Dandekar can be adopted, since it is felt that this method of scaling can lead directly to a system of grading. Appendix C gives different types of grading systems. Prof. Dandekar is of the view that the frequency distribution of marks in the earlier years is better than applying the normal distribution. The distribution of marks as given by the examiners are usually not normal and often they are far from being normal. Under the conditions, it may be advisable to adopt certain measures which are more direct descriptions of the pattern of distribution. The simplest and the most direct description of a pattern of distribution is to indicate the number of the proportion of candidates who have secured marks between certain ranges.

MARKS TO GRADES

S. No.	Percentage of candidates	Range of marks	Letter grade	Description	Points
1.	3 %	79 and above	O	Outstanding	6
2.	7 %	73–78	A	Very good	5
3.	22 %	65–72	B	Good	4
4.	36 %	53–64	C	Average	3
5.	22 %	40–52	D	Below Average	2
6.	7 %	32–39	E	Poor	1
7.	3 %	30	F	Very Poor	0

In this table, the *first column* (Percentage of candidates) represents a decision that the entire range of marks shall be divided into 7 groups and that each group shall contain the indicated percentage of students.

The second column (Range of marks) is determined empirically. It is based on the *actual* mark awarded in the particular subject in the last 3 years (A period of 4 or even 5 years also can be considered). In fact the way the first two columns are generated for this particular subject is something like this:

The answer books for each year are arranged in the rank order of their marks, from highest to lowest and a tabulation of marks for each year is made. The distributions for the 3 years are then combined to form the standard scale. Table below shows the normative standard Table for a subject "Compulsory essay in philosophy" for M.A. Degree Examination for the years 1973, '74 and '75.

S. No.	Letter grade	Percentage of candidates	1975	1974	1973	Average range of marks
1.	O	3 %	113–123	104–117	111–113	109–118
2.	A	7 %	98–112	93–103	100–105	97–108
3.	B	22 %	93–97	87–92	89–99	89–96
4.	C	36 %	80–92	78–86	74–88	77–88
5.	D	22 %	73–79	70–77	65–73	68–76
6.	E	7 %	58–63	66–69	48–63	54–67
7.	F	3 %	53	60	48	49

The range of marks for each group of student is entered in Col. 2. The table shows that 3% of students had marks of 79 and above, the next 7% had marks of 73 to 78 and so on.

In a second subject, like "Monetary and International Economics" for M.Com., Degree (Max. Marks = 200). The table may look like this.

S. No.	Percentage of candidates	Range of marks	Letter grade
1.	3%	114 and above	O
2.	7%	109–113	A
3.	22%	100–108	B
4.	36%	85–99	C
5.	22%	65–84	D
6.	7%	44–64	E
7.	3%	43	F

This table can be prepared one for each subject, then this table becomes the standard for the subject. Appendix D gives samples of Normative standard Tables prepared with the results of Post-graduate Examinations, M.A./M.Com./M.Sc., of University of Madras. The Research Cell acknowledges with grateful thanks the authorities of the University of Madras in making available examination results during and immediately after the Workshop on Grading (December, 22, 23, 1975). This table need not be used by the examiners. They can mark as they choose and the standard can be applied by the university. As each examiner's set of answer books is returned to the university, his books should be arranged in rank order and then the books are remarked to fit the standard scale. Examiners will be required to mark the 1976 examination in the same way they were doing in the early years. The Normative table for the particular subject will be used to convert the marks of students into Grades. Result of this is that a uniform standard of marking is applied to all students who have written the examination. No student would suffer because of the disparate standards of examiners.

The normative standard should be kept up-to-date. This may be done by revising it each year; adding the latest year's marks and discarding the marks of the earliest year. Thus the standard scale is always based on data for the most recent 3 year period. It is recommended that the percentages in Col. 1 should be the same while the range of marks would be expected to differ in different subjects. This table is very close to the one developed by Prof. Barrow.[9]

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[9] Barrow (pp 127-137) Examinations in Higher Education, Inter University Board of India, 1971 (Now Association of Indian Universities)

LETTER GRADES ARE THUS THE SYMBOLS TO BE USED IN THE ANNOUNCEMENT OF EXAMINATION RESULTS

These grades would be assigned for each paper in the Examination. The overall grades are needed if we wish to combine the grades for different papers. Let us assume that there are 8 papers for the course each carrying 100 marks and that the grades obtained by a student are O, A, A, B, A, B, A, B, in different papers, the grade point average of the student will be

$$\frac{6+5+5+4+5+4+5+4}{8} = \frac{38}{8} = 4.75 \rightarrow \text{A}$$

On the other hand if each of these 8 papers carries weights or credits in the order of let us say 4, 2, 1, 4, 2, 2, 4, 4 the grade point will be calculated as under.

$$\begin{array}{r} 6 \times 4 = 24 \\ 5 \times 2 = 10 \\ 5 \times 1 = 5 \\ 4 \times 4 = 16 \\ 5 \times 2 = 10 \\ 4 \times 2 = 8 \\ 5 \times 4 = 20 \\ 4 \times 4 = 16 \\ \hline 109 \\ \hline \end{array}$$

Grade point average =

$$\frac{109}{4+2+1+4+2+2+4+4} = \frac{109}{23} = 4.74 = \text{A}$$

Table below gives a sample of Grade point average calculation in three subjects like Maths, Physics and Chemistry.

	Mathematics		Physics				Chemistry			
	written		Theory		Practical		Theory		Practical	
	External	Internal	Internal	Exam.	Internal	Exam.	Internal	Exam.	Internal	Exam.
Marks allotted	60	40	25	75	40	10	25	75	40	10
Weights	12	8	5	15	8	2	5	15	8	2
Grade obtained by a student	A	B	A	A	A	C	D	C	C	A
Points	5	4	5	5	5	3	2	3	3	5
	12 × 5 =60	8 × 4 =32	5 × 5 =25	15 × 5 =75	8 × 5 =40	2 × 3 =6	5 × 2 =10	15 × 3 =45	8 × 3 =24	2 × 5 =10

Grade Point Average = 327/80 = 4.09 → B

3.0 USES OF GRADING SYSTEM

Grading system is to be thought of

(a) When we need a more uniform means of evaluation among different universities.

(b) When we need a greater comparability among disciplines and within the discipline.

(c) When we need greater internal coherence in the choice of subjects by students.

(d) When we need greater mobility of students from one university to another within a State or from one State to another.

Grades are to be used when:

(a) The error of measurement in terms of marks renders it difficult to make fine distinctions. A range of marks has better meaning than individual marks. This happens in essay type examinations very frequently.

(b) It is not possible to give along with raw marks such other details like Mean, Standard Deviation, Reliability Coefficient and Standard Error of Measurement. Where this can be done, there is no need for grades.

(c) Assessments of assignments, projects, theses are undertaken. Very often various heads of assessments and relative marks are allotted and students' work assessed on these; total marks are obtained and later converted into grades. A better procedure shall be to compare the students' assignment, project or thesis with graded assignments, projects and theses already available. Until and unless teachers and examiners become experienced and collect differently graded assignments, projects or theses, this shall not be possible.

(d) It will be difficult for the Universities/Examination Boards to maintain the traditional pattern of marks when they reconstruct their question paper with more variety and larger number of questions. There is no reason, other than tradition, for a paper to continue to carry 100 marks. Yet paper setters often feel constrained to maintain the accustomed pattern even though it may not be appropriate for a new kind of paper. Grading takes the emphasis away from marks. The maximum mark or mean mark is not itself important. The function of marks is to lead to the rank order of the students and on this rank order, grades can be based.

(e) It is important that teachers employing many procedures for evaluating achievement (tests, oral recitation, observation of performance, written assignments) must report an over-all assessment.

(f) Even after scaling, an appreciable amount of error still remains.

4.0 ASSIGNING GRADES

Grades can be assigned in one or the other of the two ways

(1) On absolute standard: Standardised and graded projects, assignments and theses are collected and studied. If a new project, assignment or thesis is to be assessed a comparison

is made of this with the graded ones and grade decided on this basis. Project work of students, assignments, theses, drawing work, laboratory work etc., lend themselves to this kind of grading.

(2) By converting marks into grades: In this procedure various heads of assessment are decided and marks are allotted. A student's work is assessed on individual heads of assessment and total marks found out and then converted into grades, for example in a theoretical assignment, the heads and marks are:

	Quality	Speed	Method	Accuracy	
	4	3	6	7	out of 20
A student's work may obtain					
	3	2	4	3	out of 20
				This is a B Grade	

SOME PROBLEMS & POSSIBLE SOLUTIONS

1. Why seven grades? Why not more or fewer?

The decision is necessarily somewhat arbitrary. To use 7 categories is definitely better than using 101. But seven is not a magic number. Most commonly used grading scale in educationally developed countries is 5 point scale (USA, UK, Sweden, Germany).

5 point scale	GCE A level in UK UGC Plan 73 (Grades 1, 2, 3, 4, 5 meaning outstanding, very good, good, fair and poor)
7 point scale	International Baccalaureate Examination (A and B grades into A1, A2, B1 and B2)
9 point scale	A.E.T. Barrow, Dr. Hill (adopted in India at the JNTU, Hyderabad)

UGC (Recommendations of Zonal Workshop on Examination Reform 1975)

"The main consideration to be borne in mind in choosing a particular scale should be that it conforms to the distinctions that teachers and examiners usually bear in mind when classifying a group of students."

Ordinarily teachers think of a student as excellent (outstanding) very good, good, average, below average, poor, very poor. This indicates the normality of a 7 point scale. The limitations of a 5 point scale is that for such purposes as the award of fellowships, it would not be suitable in view of the fact that it does not give finer discriminations. To quote Prof. Dandekar :

> "Two sets of marks which agree in respect of candidates falling in each of these five classes will have patterns of distribution which are similar for all practical purposes. If a closer agreement is desired we may split up some of the five classes mentioned above and obtain say 7 or 9 classes. Two sets of marks agreeing in respect of the proportions of candidates falling in each of the seven classes will evidently agree in their pattern of distributions even more closely and if they agree in respect of 9 such classes, the agreement will be all the more close. It is however recommended that a group of teachers can come to a decision regarding the points in the grade system. Research Cell of AIU, is likely to undertake the design of grading system through responses on a questionnaire to be circulated to university departments, and also analyse the past examination results to make a comparative study of different point scales and publish the results of this study and make it available to all universities."

UGC 7 Point Scale

The teachers can mark the examination scripts as at present in terms of numerical marks. The numerical marks can be then translated to grades. Award O (outstanding) to the top mark and F to the fail mark and distribute the remaining marks between O & F on the basis of equal intervals.

For example Maximum marks in a subject is 77; Minimum marks is 36

71 – 77	O
64 – 70	A
57 – 63	B

50 – 56	C
43 – 49	D
36 – 42	E
< 36	F

Similar tables may be constructed for each subject or paper and this will only provide a rational basis.

In case it is found that some departments or colleges are over estimating or underestimating the performance of their students in internal assessment or external examinations. This can be test checked by means of the normal distribution curve or frequency distribution of marks in the earlier years either by the university or by a central agency

Normal Distribution

(UGC)

A	7%
B	24%
C	38%
D	24%
E	7%

There is a consensus in respect of the points of scale to be adopted. After considerable discussions, all the Workshops (Delhi, Chandigarh, Bombay and Madras) convened by UGC during October–December, 1975 have accepted to adopt 7 *points scale*. The UGC recommendation to divide the range between maximum marks awarded and the minimum marks awarded equally to denote different grades suffers from serious disadvantages in that

(a) The equal range of marks for different grades is irrational and unscientific. There is no justification.

(b) Considering minimum marks (usually ones around 35) for each subject are arbitrary.

The discrepancies on adopting equal marks intervals for different grades are brought out in the Table below.

Table below gives a comparison of marks to grades conversion by both methods.

S. No.	Percentage of candidates		Actual range of marks		Range of marks on equal marks intervals	
(1)	3%	(4 students)	79 and above	O	74–81	21 students
(2)	7%	(11 students)	73–78	A	66–73	24 students
(3)	22%	(33 students)	65–72	B	58–65	45 students
(4)	36%	(65 students)	53–64	C	50–57	30 students
(5)	22%	(38 students)	40–52	D	42–49	23 students
(6)	7%	(11 students)	32–39	E	34–41	15 students
(7)	3%	(5 students)	<31	F	<34	9 students
		167 students				167 students

2. How do we determine the percentages in Column. 2 in Normative Table.

This must be the university's decision. It is a decision first about what proportion of students should pass the examination. This table shows 90% which is much higher than what obtains now in the present marking system-as I think it ought to be. The university must adjust this as it deems fit. Again a decision about the proportions who shall attain the various grade levels. The distribution shown is not symmetrical. There are a few more students at the above average grades than at the below average grades. The university may make a decision.

The fundamental issue is that the university must decide what distribution of grades it considers appropriate. Then it should continue to use the distribution upon which it has decided. This grade distribution is a kind of "academic currency" that must retain a generally stable value. Adjustments may be made, however, if and when the university has solid evidence from other sources (not from examinations) that the general ability level of students has changed. For the same university, transformation of marks to grades in different subjects is shown.

3. Are the procedures of scaling marks and translating them into grades too complex; too technical, to be workable?

No statistical expertise is required to develop and use this kind of grading scale.

4. Is it wise to change the familiar and accepted marking system to something new?

There are so many defects in the old system that it is very difficult to justify its retention. Again too much of what is known about it is not true.

5. Must students be marked on an absolute scale or is a relative scale defensible?

Many believe that percent marking is based on a fixed standard or absolute standard and it is an illusion. To act as if it were a reality is to deceive ourselves and what is worse deceive the public. That is what we do when we say that any fixed number of marks is required for passing an examination. No university has an evidence that a mark of 35 on this year's examination is equivalent to last years' 35. The university is not justified and is deceiving itself when it declares that any fixed number of marks is required for passing an examination. In fact, the university departs at times from its own standards. If too few students pass, the marks are moderated which is a pretence that the passing mark has retained its sanctity. It should not have had the sanctity at the first place. The university would do better to admit that the proportion of students who pass is a more stable base for judgment than is a required minimum pass marks.

6. Are grades relative? Relative to what?

We have to recognise and accept openly that grades are relative. The question then is relative to what? relative to a "reasonable expectation" of how well students ought to perform on an examination? who judges as to what is reasonable? We know that those who actually do the judging (examiners) do not agree.

The best answer is to say that students should be judged in relation to their "peers". In the last 3 years (4 or 5 sometimes), many hundreds of students have written the examination and the standard is based on the performance of this large number of students. There is very little difference in the ability of such large groups from year to year. This is a dependable standard, it has a high degree of stability.

7. There is possibility of error in the grading scale.

It may be that with fewer categories (7 vs. 101) we will not make as many errors but the ones we make may be more serious. There will be border line cases. What about one who gets 79 when 79 and above gets 0 and 73–78 gets A. More serious will be the mark 39 when 40 is pass mark (say). These can be tackled from an approach of probabilities (Misra, Taylor, Tluange). We may take some precautions to avoid. The university could have all papers which are "bare misses" at any grade level marked again by different examiners or this might be done only for those who are just below the passing mark.

8. It may be possible that students by agreement among themselves can lower the standards i.e., students will deliberately slacken their effort when they know that each student's grade will be relative to the performance of other students.

The answer to this is that this is unlikely to happen.

9. Will it be more advantageous for a group of universities, perhaps those in a region, to think about such a problem together, reach an agreement and act together?

Even though all Indian universities should come together and solve such problems at-least those in the region should try to solve the problem together to introduce uniformity. In a similar way Question banking, Internal assessment etc., could be tackled.

10. Some educationists think that grades are very coarse and they are made as an excuse to persist with high degree of subjectivity in judgment. But the scientific way to look at grades is that they are rational in differentiating between students (i.e. an A grade student is definitely superior to a B grade student) and that the distinctions made out by grades are meaningful and realistic.

11. Some employers and those who admit students for post-graduate study may feel that it will be impossible to choose one amongst many who obtained A. Let us be very clear about it. These students who all obtained A's are all equal and nothing more, nothing less. Separate tests and other procedures specially designed to evaluate the suitability of candidates must be designed and adopted. An alternative will be to think of an overall Grade point average for

the course correct to two decimals. This will be able to differentiate between students of the same grade in a finer manner to enable selection of a few restricted A's amongst many who got A.

12. Grading system suits immensely project work, assignments and theses and laboratory practical work.

13. Several other universities had not adopted the grading system; considerable difficulty will be experienced by the alumni of an university to obtain admission to those universities.

There are two alternatives; If grading is accepted by all universities in the country or atleast by a group of universities in a region, then uniformity can be attempted by adopting say 7 point scale (as decided by Zonal Workshops at Delhi, Chandigarh, Bombay and Madras). The other alternative will be to use grade point average and suitable admission tests.

14. Various appointing authorities want grades to be translated into atleast percentages of marks. This adds to the work of the university.

This is not a problem in the interim transition periods when marks are converted into grades with the help of Normative Standard Tables. After a few years when teachers and examiners get used to grading system, meaning of different grades would be familiar to everyone then. The problem is very similar to the one faced by us when metric system was introduced.

15. In regard to professional examinations the grades were translated into the minimum marks in that grade and students who got more marks than the minimum reckoned, were at a disadvantage. This was particularly done by Madras and Kerala universities when they tried grading for a few years and gave up later.

This is obviously wrong since transformations from grade to marks are meaningful only with respect to a range of marks for a particular grade.

16. Candidates applying to foreign universities for a seat were requested to obtain the actual marks secured by them. For students going abroad for their studies, the Reserve Bank of India requires submission of marks obtained by each student applicant before releasing foreign exchange.

Here again grades need not be converted into marks. Grade point averages along with the current Normative Table may be made available for such cases.

17. Award of medals and prizes has also called for communication of the names of students obtaining the highest marks.

Grade point average can help and certainly other procedures must be devised to select the best among those who had the same grade point average. The probability of the same grade point average to the second decimal occuring more then once is very low. It is time that suitable scientific selection procedures are devised and achievement and selection are not mixed up anymore.

18. Grading system does not allow ranking of candidates.

Candidates are ranked only and with the use of Normative Standards, grades are given. It is true that among those who are graded with equal grades, there is no distinction.

19. Some colleges over many years have established traditions in that nearly 80 to 90% of their students obtain first divisions while there are a few colleges where not even 1% of their students obtain First divisions. There is a fear on the minds of some that the better college is put to difficulties while the bad ones are at an advantage.

The fear is really baseless; since the examiner is going to mark and it will so happen that a majority of students from the better college will obtain marks in the higher ranges and therefore good grades. Once the Normative Table for a subject is prepared, then Ranges of Marks and Grades' columns only will be used. However, it is better (and preferable) to randomise scripts and it is recommended that the Gauhati method of using Random Number Table be adopted by all universities. Once this is done, each set of papers (randomised) will have the same sort of distribution as used in the construction of Normative Tables.

20. Many Vice-chancellors are of the feeling that there is added strain in the controller's office and that examiners are to be given training in grading of answer papers.

It was amply demonstrated by the Project Officer (Examinations) of AIU that Normative Standard Tables for different subjects from the results of the last 3 years of the University of Madras, can be constructed easily and within an hour per subject. It is however suggested that in examinations (PUC) where nearly a lakh of students appear, a random 10% sample may be taken and table constructed.

Once the table is constructed, it is available for use and only slight modification is required to make it uptodate every year.

A computer programme can be written to generate the Tables from the results and also for making the Tables uptodate. It is gratifying to note that a few universities have already started using computers in their examinations and others are on their way.

As far as the training of examiners in grading is concerned, it is absolutely essential that one day workshops on grading answers be conducted by individual universities with the expert guidance of UGC/AIU and other bodies.

APPENDIX–A

SCALING

If different sets of marks are to be added or to be compared they need to be scaled to a common standard whenever such standard is lacking. It is lacking when

(a) a student's mark in one subject is added to his marks in other subjects to arrive at an aggregate mark;

(b) the answer books, of students are marked by different examiners;

(c) marks derived from internal assessment are combined with marks on University examinations.

When we consider the marks awarded by different examiners, we need first to know which marks ought to be scaled. When one examiner gives higher mark than another, there are two possible reasons for the difference. Perhaps the first examiner was marking the answer books of better students. Or it may be that the standard of marking was more lenient. Unless we can know which of these is the true reason we are not able to apply any corrective measures. Therefore it is necessary to randomise the answer books before they are given to examiners for valuing. When this is done in a through way, it ensures that all examiners are marking batches of answer books that are equivalent in quality. We can be reasonably sure that differences in the marks of examiners should be attributed to their different standards of marking not to their quality of answer books.

Prof. Dandekar's method of scaling can be adopted.

Conversion of raw scores into derived scores (Z score, T score or percentile rank) has been discussed in great detail. These are scaling procedures worthwhile adoption.

CONVERTING RAW SCORES INTO DERIVED SCORES

There are three principal bases for expressing examination scores. A comparison with an absolute standard B inter-individual comparison and C inter-individual comparison.

A Comparison with an "absolute standard"

(1) Percentage correct scores

(2) Letter grades

B Inter-individual comparison... ...

Based on Mean Standard deviation	Based on Rank within groups	Based on range of scores in a group
(i) Z scores	(i) Ranks & bands	(i) Percent placement
(ii) T scores	(ii) Percentile Ranks	
(iii) AGCT scores	(iii) Letter grades	
(iv) CFEB scores	(iv) Normalised Standard scores (a) T scaled score (b) Stanine score (c) C scaled score	

C Intra-individual comparison

(i) Ratio IQS
(ii) Intellectual status index.

Since most of our examinations involve inter-individual comparison, it is necessary for us to know the various methods of converting raw scores to derived scores to make them more meaningful. The Z score is basic to all other derived scores based on Mean and Standard deviation. Z score tells in simple terms the difference (or distance) between a stated group's mean and any specified raw score value

$$Z = \frac{x - \bar{x}}{S.d} \quad \text{Where } x = \text{a specified raw score}$$

$$\bar{x} = \text{Mean of scores}$$

$$s.d. = \text{standard deviation of scores}$$

T score corresponding to a raw score = 10Z + 50 where Z = Z score AGCT (Army General Classification Test) score = 20Z + 100 CEEB = 100Z + 500 (College Entrance Exam. Board Score). Table 1 and Table 2 show these derived scores for objective type test and essay examination. Based on rank within groups, percentile rank is a personx's relative position within a group – Table 3 indicates a method of finding percentile ranks when the distribution of raw marks is skewed and different from normal distribution, T scaled score is preferred. It is shown (10) elsewhere

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10. Natarajan, V. On the Conversion of raw scores into derived scores—A Research Study. Journal of Educational Research & Extension, Coimbatore (under publication).

that T scaled score is not at all superior to T score and that considering the time and effort spent to find T scaled score in relation to T score, T score itself is adequate. Percent placement score indicates a person's position on a 101 point scale where the highest score made is set at 100 and the lowest at 0.

$$\% \text{ placement} = \frac{100\,(X-L)}{(H-L)}$$

X = Any raw score
L = Lowest raw score
H = Highest raw score

Of these percentile ranks seem to be the best derived score for inter-individual comparison. T scores offer a similar advantage. With T scores.

1) The original distribution is not altered but linearly transformed.
2) Scores in different subjects can be added.
3) Standards over successive years in subjects can be set and maintained.
4) There is provision for correcting boosted up distribution of marks.

TABLE I

S.No	Marks (x)	Frequency (f)	xf	x^2	fx^2	$(x-\bar{x})$	Z Score $\frac{(x-\bar{x})}{Sd}$ (y)	10y+50	T Score	AGCT	CEEB	Percentile Rank
1	18	4	72	224	1296	+ 5.1	1.82	68.2	68	136	680	98
2	17	3	51	289	867	+ 4.1	1.48	64.8	65	130	650	93
3	16	6	96	256	1536	+ 3.1	1.10	61.0	61	122	610	87
4	15	11	165	255	2475	+ 2.1	0.74	57.4	57	114	570	76
5	14	9	126	196	1764	+ 1.1	0.39	53.9	54	108	540	63
6	13	9	117	169	1521	+ 0.1	0.03	50.3	50	100	500	51
7	12	8	96	144	1152	− 0.9	− 0.33	46.7	47	94	470	40
8	11	11	121	121	1331	− 1.9	− 0.68	43.2	43	86	430	27
9	10	5	50	100	500	− 2.9	− 1.02	39.8	40	80	400	17
10	9	6	54	81	486	− 3.9	− 1.40	36.0	36	72	360	9
11	8	2	16	64	128	− 4.9	− 1.76	32.4	32	64	320	4
12	7	1	7	49	49	− 5.9	− 2.15	28.5	29	58	290	2
13	6	1	6	36	36	− 6.9	− 2.50	25.0	25	50	250	1
		$\Sigma = 76$	$\Sigma = 977$		$\Sigma = 13141$							

$$\text{Mean } \bar{x} = \frac{\Sigma\, xf}{\Sigma\, f} = \frac{977}{76} = 12.85 \approx 12.9$$

$$\text{s. d.} \quad = \sqrt{\frac{\Sigma\, f\, x^2}{N} - \left(\frac{\Sigma\, x\, f}{N}\right)^2}$$

$$= \sqrt{\frac{13141}{76} - (12.85)^2} = \sqrt{172.8 - 165.1}$$

$$= \sqrt{7.7}$$

$$= 2.77$$

1. $\text{SE Mean} = \frac{\text{sd}}{\sqrt{n-1}} = \frac{2.77}{\sqrt{75}} = 0.12$

$$\text{Mean} = \quad 12.85$$

$$-0.12 \qquad +0.12$$

$$= 12.73 \qquad 12.97$$

2. IME = Index of Measurement Efficiency

$$= 1 - \frac{0.16\ k}{\sigma^2}; \quad \sigma^2 = (\text{sd})^2 \quad k = \text{no. of items}$$

$$\sigma = \text{s.d.}$$

$$= 1 - \frac{0.16 \times 20}{7.7} = 1 - \frac{3.2}{7.7} = \frac{4.5}{7.7} = 0.584$$

3. $\text{SE Measurement} = \text{sd} \sqrt{1-r}$

$$= 2.77 \sqrt{1-0.584}$$

$$= 2.77 \sqrt{0.416}$$

$$= 2.77 \times 0.61 = 1.69$$

TABLE 2

S.No	Marks (x)	Frequency (f)	(xf)	$(x-\bar{x})^2$	$(x-\bar{x})^2 f$	Z Score	T Score	AGCT Score	CEEB Score	Percentile Ranks	T Scaled Score
1	84	4	336	121	484	+ 1.1	61	122	610	90	62.5
2	80	3	240	49	147	+ 0.7	57	114	570	73	56.0
3	76	3	228	9	27	+ 0.3	53	106	530	58	52.0
4	72	2	144	1	2	+ 0.0	50	100	500	45	49.0
5	68	5	340	25	125	− 0.4	46	92	460	28	44.0
6	56	2	112	289	578	− 1.6	34	68	340	10	37.0
7	52	1	52	441	441	− 2.0	30	60	300	3	30.0
		$\Sigma = 20$	$\Sigma = 1452$		$\Sigma = 1804$						

$$\bar{x} = 145/20 = 72.6 \approx 73$$

$$S.E._{MEAN} = \frac{S\,D}{\sqrt{n-1}} = \frac{9.5}{\sqrt{19}} = 2.18$$

$$\text{Variance} = 1804/20 = 90.2$$

$$Sd = \sqrt{90.2} = 9.5$$

TABLE 3

Percentile Rank Calculation

S.No.	Mark x	Frequency f	cf	cf_{mp}	CP_{mp}	P.R.
1	18	4	76	74.0	97.5	98
2	17	3	72	70.5	93.0	93
3	16	6	69	66.0	87.0	87
4	15	11	63	57.5	76.0	76
5	14	9	52	47.5	62.5	63
6	13	9	43	38.5	50.8	51
7	12	8	34	30.0	39.5	40
8	11	11	26	20.5	27.0	27
9	10	5	15	12.5	16.6	17
10	9	6	10	7.0	9.2	9
11	8	2	4	3.0	3.95	4
12	7	1	2	1.5	1.98	2
13	6	1	1	0.5	0.66	1

cf	Cumulative frequency
cf_{mp}	Cumulative frequency of midpoint
Cp_{mp}	Cumulative percentage of midpoint
P.R.	Percentile Rank

APPENDIX B

ERROR IN MARKING & SOURCES OF ERROR

Let us consider the obtained or raw marks of 5 individuals. Let it be possible for us to estimate the error in these raw marks, so that their true marks are also possible to obtain on this basis. If we make a statistical analysis of these sets of scores (obtained or raw score; error score and true score) in terms of Mean, Variance etc., we find that

$$V_o = V_t + V_e;\ V_t/V_o = 1 - \frac{V_e}{V_o} = r \text{ (reliability coefficient)}$$

Standard error of measurment $= \sqrt{V_e}$

V_o = Variance of observed scores

V_t = Variance of true scores

V_e = Variance of error scores

TABLE

S. No.	Student	Obtained Score	Error Score	True Score
1	A	16	−2	18
2	B	10	+1	9
3	C	17	+2	15
4	D	22	+1	21
5	E	10	−2	12
	Mean	15	0	15
	Variance	20.8	2.8	18.0

Reliability $= 18/20.8 = 0.865$; SE Measurment $= \sqrt{2.8} = 1.67$

Applying McMorris formula reliability coefficient of the test as $r = (1 - \frac{0.16k}{\sigma 2})$ we obtain reliability

$$= 1 - \frac{0.16 \times 25}{20.8} = 1 - \frac{4.00}{20.8} = \frac{16.8}{20.8}$$

If we multiply by $\frac{k}{k-1}$ i. e. $\frac{25}{24}$; $r = \frac{16.8}{20.8} \times \frac{25}{24} = 0.85$

$$\text{SE Measurement} = \text{Sd}\sqrt{1-r}$$

$$= \sqrt{20.8}\ \sqrt{1-0.85} = \sqrt{20.8} \times \sqrt{0.15}$$

$$= \sqrt{3.02} = 1.72$$

The effect of error Variance V_E (low reliability) is to introduce an uncertainty (standard error) into any mark allotment. This reduces the ability of the test to discriminate between students of differing attainment. If this inability of a test (of low reliability) to make fine discriminations is ignored; use of observed scores in classifying students will become a spurious activity. In order to improve the reliability, it is necessary to bring down error variance to the extent possible.

There are many sources of error variance. Some of them are :

a) Subjectivity in marking

It is well known that one of the greatest problems facing the examination Boards in their use of essay examinations, is the problem of getting the student's answers accurately marked. Equally competent markers looking at a student's answer come up with different marks and worse still to the same student's answer on different occasions. This is entirely due to subjective judgment in marking. Taylor[11] demonstrated that three examiners marking 45 candidates in PU examination in 1962 agreed in their marks to 4.8% of cases; differed by 5 marks in 69% of cases and differed by 10 marks or more in 33% of cases. Harper[12] has brought out the discrepancies in 90 markers marking 10 history scripts. The author[13] through an Exercise in marking (an eighth grade) arithemetic problem) amply demonstrated that equally competent examiners differed considerably in their marking the same student's answer (range from 0 out of 10 to 9 out of 10; Mean around 5.6; s.d = 2.4 to 2.7).

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[11] Taylor, H. J. Operation pass mark. Gauhati University, 1963.

b) Error due to biassed sampling of topics :

Any test or examination is only a sample of a universe of questions that can be asked. The sample must be representative. Variations in observed scores will result if the sampling is defective. The remedy seems to be sampling the subject with a Table of Specifications and/or testing the whole subject usually by objective type tests.

c) Error due to biassed sampling of abilities :

Variations in observed scores will result if abilities are not properly sampled in relation to teaching. This error can be minimised by a table of specifications.

d) Error due to allowing student a choice of questions

Supposing a test or examination permits students to choose five out of ten. There are 252 ways of doing this i.e. 252 different tests or examinations that have been taken. This variation produces variation in test scores unrelated to their true variation in attainment.

Harper[14] showed that a paper that requires students to answer 5 out of 9 questions can be considered a fair test for only 135 of 1000 students. Singha[15] has analysed the total implications on study habits.

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[12] Harper A. Edwin Jr. "Ninety Marking Ten — A Study of Examinations" Indian Education Review Vol. 2, 1967.

[13] Natarajan, V. An Exercise in Marking, Workshop on Evaluation for College Teachers, AIACHE, Madras 1975.

[14] Harper A. Edwin Jr. "Chance in the traditional Examination" Journal of Education & Psychology, Vol. 20, 1962.

selective examining, unreliable comparability etc. very well.

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15. Singha, H. S. Choice in Examinations. New Frontiers in Education.

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e) Error due to arbitiary time limits:

In examinations, the introduction of a time limit introduces a variation in observed scores which is not related to a variation in their attainment. This is minimised by pretesting to find the optimum required time—a typical procedure if we adopt question/item banks.

f) Error due to assumption in addition of marks:

In adding individual marks to obtain a final test score for one student, it is assumed that marks are of equal weight and scaler. These are invariably false and lead to variations in observed scores. This is minimised by ensuring that each mark is equal in weight and that each mark awarded correlates with the final test score to give linear vector addition. This check (discrimination) index is quite common with objective type tests.

All the things discussed finally culminate into an error in marking and this error variance gives us a clear picture of observed scores. If Universities/Examination Boards in our country at all levels take steps to indicate along with raw marks in each subject for a student details like Mean, Standard deviation, realiability coefficient, and error in measurement, there will then be no need for any treatment of observed scores.

APPENDIX C

GRADING

Reporting the results of University Examinations or of internal assessment or of a combination of the two in terms of a grading scale instead of the familiar marking scale is not widely advocated in India but its support is growing. For example a Committee of the Central Advisory Board of Education[16] has said that for all public examinations, "the result should be declared subjectwise and furnished in the form of grades; the raw marks given by the examiners should never be made available".

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[16] Central Advisory Board of Education, Report of the Committee on Examinations, New Delhi, NCERT, 1971.

Transforming marks into a smaller number of grades, each grade representing a range of marks would give us a more .dependable differentiation among the students. A grading scale does not attempt to make such fine distinctions as envisaged by 101 point marking and therefore it is less misleading. It groups students into a smaller number of categories representing a range of marks and we can be more confident that the range within which a student is placed gives an accurate indication of his standing. It is usual to make this range correspond to twice the standard error of measurement/for example refer to Table I, if SE Measurement is rounded off to 2 marks

16 to 20	A
12 to 20	B
8 to 11	C
< 8	D

Several grading scales have been advocated, from time to time.

1) **Assuming a normal distribution :**—This is possible in public examinations of a huge number of students who are hetrogenic.

Letter Grade	Point Grade	Percent of population	Classification
A	1	7%	Outstanding
B	2	24%	Very good
C	3	38%	Good
D	4	24%	Fair
E	5	7%	Poor

In this system, E grade is a poor grade and not a fail.

2 **City and Guilds**

80 to 90%	A
60 to 70%	B
50 to 60%	C
40 to 50%	D
<40%	E

3 **Dressel and Nelson**

A	0 to 15%
B	Next 20 to 30%
C	40 to 50%
D	10 to 20%
E	0 to 1%

4 Stanford

A	15%
B	35 %
C	35%
D	10 to 15 %
E	0 to 5%

5 Wood

A	9 to 12 %
B	26 to 28 %
C	30 to 44 %
D	26 to 12 %
E	9 to 4 %

6 Moury & Berg

A (average + 2 average deviation) and above	5 %
B (average + 2/3 average diviation) and above	25%
C (average – 2/3 over deviation) and above	40%
D (average – 2 over diviation) and above	25%
E	5 %

7 Prof. Dandekar's Classification

Range of Marks	Percent of population	Grade No.		
80 & above	2 %	1	A_1	Very good
70 to 79	8 %	2	A_2	
63 to 69	10%	3	B_1	
59 to 62	14 %	4	B_2	Above average
55 to 58	16 %	5	C_1	
50 to 54	20%	6	C_2	Average
45 to 49	10 %	7	D_1	Below average
40 to 44	10 %	8	D_2	Pass
39 to below	10%	9	F	Fail

8 Duggal (1968) Classification

A	Excellent	4
B	Good	3
C	Fair	2
D	Pass	1
F	Fair	0

9. Based on Z score

Z score $+ 1.0 \rightarrow$ A
$- 1.0$ to $1.0 \rightarrow$ B
$< - 1.0 \rightarrow$ C

$+ 1.5 \rightarrow$ A
1.0 to $1.5 \rightarrow$ B
$\left.\begin{array}{r} 0 \text{ to } 1.0 \\ - 1.0 \text{ to } 0 \end{array}\right\} \rightarrow$ C
$- 1.0$ to $- 1.5 \rightarrow$ D
$< - 1.5 \rightarrow$ E

10. Based on percentile ranks

90 % above	A
65 % to 90 %	B
30 % to 65 %	C
10 % to 20 %	D
10 %	E or F

100 (101 point Scale) 0

(3 point Scale)
Outstanding **Average** **Very Poor**

(5 point Scale)
Outstanding **Above Average** **Average** **Below Average** **Very Poor**

(7 point Scale)

Outsanding	**Very Good**	**Good**	**Average**	**Below Average**	**Poor**	**Very Poor**
O	**A**	**B**	**C**	**D**	**E**	**F**

APPENDIX D

NORMATIVE STANDARD TABLE

M.Sc. (Physics) QUANTUM MECHANICS *(100 Marks)*

S.No	Percentage of Candidates		Range of Marks (1975)	
1	3 %	(4 Students)	79 & above	O
2	7 %	(11 Students)	73–78	A
3	22 %	(33 Students)	65–72	B
4	36 %	(65 Students)	53–64	C
5	22 %	(38 Students)	40–52	D
6	7 %	(11 Students)	32–39	E
7	3 %	(5 Students)	< 31	F

NORMATIVE STANDARD TABLE

M.A. (Economics) MONETARY & INTERNATIONAL ECONOMICS *(200 Marks)*

S.No	Percentage of Candidates	Range of Marks 1975	1974	1973	Average Range of Marks
1	3%	114 & above			
2	7%	109–113			
3	22%	100–108			
4	36%	85–99			
5	22%	65–84			
6	7%	44–64			
7	3%	< 43			

NORMATIVE STANDARD TABLE

M.A. (Philosophy) COMPULSORY ESSAY *(175 Marks)*

S.No	Letter Grade	Percentage of Candidates	1975	1974	1973	Average Range of Marks
1	O	3%	113–123	104–117	111–113	109–118
2	A	7%	98–112	93–103	100–105	97–108
3	B	22%	93–97	87–92	89–99	89–96
4	C	36%	80–92	78–86	74–88	77–88
5	D	22%	73–79	70–77	65–73	68–76
6	E	7%	58–63	66–69	48–64	54–67
7	F	3%	< 53	< 60	< 48	< 49

NORMATIVE STANDARD TABLE

M.Com. MANAGEMENT ACCOUNTANCY & FINANCIAL CONTROL *(175 Marks)*

S.No.	Percentage of Candidates		Range of Marks (1975)	
1	3%	(7 Students)	115 & above	O
2	7%	(18 Students)	105–114	A
3	22%	(55 Students)	94–104	B
4	36%	(95 Students)	79–93	C
5	22%	(55 Students)	70–78	D
6	7%	(18 Students)	57–69	E
7	3%	(6 Students)	< 55	F

NORMATIVE STANDARD TABLE

M.Sc (Zoology) ANIMAL PHILOSOPHY *(120 Marks)*

S. No.	Percentage of Candidates		Range of Marks 1975	
1	3%	(1 Student)	73 & above	O
2	7%	(10 Students)	71–72	A
3	22%	(21 Students)	68–70	B
4	36%	(32 Students)	65–67	C
5	22%	(25 Students)	61–64	D
6	7%	(7 Students)	59–60	E
7	3%	(2 Students)	44–58	F

APPENDIX E

PRESENT POSITION OF GRADING IN UNIVERSITIES *

(*Compiled by UGC)

1. Agra University

The University has decided to introduce a system of grading on a seven point scale.

2. Aligarh Muslim University

The matter of assessing the performance of students at the examinations in the form of grades has been accepted in principle by the Academic Council and the measure is to be implemented.

3. Andhra University

The University has not given any thought to the problem of having grades in place of marks, except that in the B.E/B.Tech. Degree course, five point letter grading has been adopted.

4. Andhra Pradesh Agricultural University

The final grading of the students is done in letter grades viz., A,B,C,D, and F. The significance of each grade and the points which it carries are given below :

% of marks to be obtained	Grade	Significance	Points
90–100	A	Excellent	4
80–89	B	Good	3
70–79	C	Fair	2
60–69	D	Pass but not satisfatory	1
Less than 60	F	Failed	0

5. Banaras Hindu University

The University has accepted the system of grading 'in principle'.

6. Bombay University

The University has decided to adopt the following system:

That the system of grading, be introduced and that necessary modification be made to the regulations relating to the award of scholarships, prizes and medals at the various examinations. That the system of awarding grades be introduced for assessment of the performance of the candidates in practicals in the subjects of Physics, Chemistry and Biology at the intermediate Science examination in place of marks as at present.

7. Calicut University

The University is willing to introduce a system of grading if simultaneous change is made in all the Universities in the State and Region.

8. Govind Ballabh Pant University of Agriculture and Technology, Pantnagar

There are several tests in each course during a trimester. The evaluation of answers is in terms of marks. At the end of the trimester the marks obtained in a course in the various tests are aggregated and converted into grades on the following basis:

Range of marks	Grade	Meaning		Numerical value of the Grade
		Under graduate	Post graduate	
80% or above marks	A	Excellent	Excellent	5
Below 80% but not less than 70% marks	B	Good	Good	4
Below 70% but not less than 60% marks	C	Fair	Fair	3
Below 60% but not less than 50%marks	D	Poor Barely pass	Failure	2
Below 50% marks	F	Failure	—	1

9. Gujarat University

The University has decided to introduce the system of grading in the Faculty of Engineering.

10. Indira Kala Sangeet Vishwavidyalaya, Khairagarh

The Committee appointed by the University has recommended that the present system of marking may continue.

11. Jawaharlal Nehru University, New Delhi

The University has adopted semester system. The students are examined in every course from time to time throughout the semester and at the end of each semester. The teacher grades the students on the results of various kinds of tests, home assignments, special projects etc. on the following 10 point scale.

Grading		Numerical Value
A+	=	9
A	=	8
A−	=	7
B+	=	6
B	=	5
B−	=	4
C+	=	3
C	=	2
C−	=	1
F	=	0

Each course is weighted by credit based on contact hours. In courses having sessional evaluation as well as end-semester examinations each evaluation carries equal weightage and the grade in a course is arrived at by taking into account the grades in sessional as well as end-semester examination. In courses not having end-semester examination the sessional evaluation carries full weightage.

While it is not possible to work out exact equivalence between the letter grade and the numerical marks, the grades from A+ to A− may be comparable to first class and grades B+ to B− may be comparable to second class.

12. Jawaharlal Nehru Technological University, Hyderabad

The University has adopted 9 point scale grading. Based on the raw score of the candidate, grades are awarded as indicated in the table given below:

Marks	Letter Grade	Grade points
91–100	A+	10
81–90	A	9
71–80	A–	8
61–70	B+	7
51–60	B	6
41–50	B–	5
31–40	C	4
21–30	D	3
11–20	E	2

13. Jadavpur University

The Faculty of Engineering and Technology has recommended introduction of **grades** in place of **marks.** The details of the grading proposed is given below:

Grades	Classification	Grade points
A	Excellent	5
B	Very good	4
C	Good	3
D	Fair	2
E	Unsatisfactory	0

14. Meerut University

Grading has not, yet been introduced. Only in one faculty i.e. faculty of education it has been recently passed by the Board of Studies and the Faculty that grading will be introduced.

15. M.S. University of Baroda

A grading system based on either five point scale or eleven point scale is in use in the four faculties where the semester and the internal assessment system is in operation. In other faculties the numerical marks system is in vogue.

16. Mysore University

System of Grading was in practice for only M.Sc. (Food Technology) but now the final result is announced in terms of classes.

17. Orissa University of Agriculture and Technology, Bhubaneswar

The University has a system of grading on a 4 point scale.

18. Osmania University

The various Heads of Departments of the University are of unanimous opinion that the present system of marking be continued instead of the grading system suggested in the report of the University Grants Commission. However, the University has already introduced Grade System in the Faculty of Technology on an experimental basis.

19. Panjab University

The University has decided to introduce a four or five point grading system in place of the present system of evaluation.

20. Panjab Agricultural University, Ludhiana

The Academic Council at its 45th Meeting held on 18th June 1975 vide item No.B-19, while considering the recommendations of the Postgraduate Committees, approved the following formula for inter-conversion of OGPA and Aggregate percentage of marks under the traditional system of examinations, for the Postgraduate students.

$$Y = 59.96 - 28.31 \times 8.33 \times^{2}$$

'Y' represents the percentage of marks in the traditional system and 'X' represents the grade point average.

Overall grade point Average on 4.00 basis	Equivalent with percentage of marks
3.00	50.00
3.10	52.25
3.20	54.66
3.30	57.25
3.40	60.00
3.50	62.92
3.60	66.00
3.70	69.25
3.80	72.67
3.90	76.25
4.00	80.00 (or above)

21. Poona University

The University has accepted the system of grading the scale of conversion into a grade from marks suitable for different subjects in the Faculties will naturally vary and it is being specified by the Boards of Studies, indicating what each grade stands for.

22. Roorkee University

The introduction of grading system has been considered by the University but no decision has been arrived at for its adoption at present.

23. Sambalpur University

Grading in lieu of numerical marking is under consideration of the University.

24. Sardar Patel University

It has been decided to introduce Letter Grade and Grade point Average system in respect of all examinations (except preparatory level) from the current academic year 1975-76. The evalution will be made on the five point scale in addition to the Letter Grade, percentage of Aggregate marks upto two decimal points will be shown in the mark-sheet to be issued by the University.

25. Saugar University

For the purpose of assesment, there shall be a five points scale of letter grades and the degree of performance connected by each letter may be given a numerical value for the purpose of computing a Cumulative Grade-Point Average (CGPA) as follows:

Letter Grade	Performance in the course	Numerical Grade points
A	Outstanding	10
B	Very good	8
C	Good	6
D	Fair	4
E	Poor	2

26. Udaipur University

Grading system has been introduced in the Agricultural Wing. The final grade in each course is determined by the teachers concerned by combining the marks given in three one-hour tests and the final semester examination. The final grading of the student is done in alphabets. Each course carries certain points. The significance of each grade point is as under :

For Undergraduate :

Grade	Points per Cr. Hour	Significance
A	4	Excellent
B	3	Good
C	2	Fair
D	1	Pass but not Satisfactory
F	0	Fail
I	–	Incomplete
W	–	Withdrawn
NC	–	Non-credit course
P	–	Progress (for projects only)

For Postgraduate :

Grade	Points per Cr. Hour	Significance
A	4	Excellent
B	3	Good
C	2	Fair
F	0	Fail
I	–	Incomplete
W	–	Withdrawn
R	–	Repeated
SR	–	Satisfactory
US	–	Unsatisfactory
NC	–	Non-credit course

27. Sri Venkateswara University

The University is considering the question of introducing grading.

INSTITUTIONS DEEMED TO BE UNIVERSITIES

28. Birla Institute of Science and Technology, Pilani

The Insitute has adopted the system of letter grading. There are five regular letter grades. Each grade connotes the degree of performance and has a numerical value for purposes of performance and has a numerical value for purposes of computing Cumulative Grade Point Average – (CGPA)

29. Central Institute of English and Foreign Languages, Hyderabad

The scale of marks has been replaced by the system of letter grades A B C D & E (failure).

30. Indian Institute of Science, Bangalore

The Institute assigns grades on a five point scale (A B C D & E) and also works out the grade point average of the students.

31. Indian School of Mines, Dhanbad

The question of introducing a system of grading is under consideration.

32. Tata Institute of Social Sciences, Bombay

The Institute gave up the grading system 10 years ago as it did not function successfully.

33. Indian Institute of Technology, Delhi

The Institute follows the following system of gading :

Undergraduate Examinations :

E	80% and above
A	70-80
B	60-70
C	50-60
D	40-50
F[1]	30-40
F[2]	Below 30

M.Tech. & Postgraduate Diploma :

Grade	Qualitative Description	Grade Point
A	Excellent	4
B	Good	3
C	Average	2
D	Poor	1
I	Incomplete	
W	Withdrawn	

The mimimum grade point average is 2.25 for the first seme

Sub-Division of Grades in the Undergraduate Examinations :

A^1	75-80
A^2	70-75
B^1	65-70
B^2	60-65

34. Indian Institute of Technology, Kanpur

The I.I.T., Kanpur follows a five point letter grading scale. T following table indicates the qualitative descriptions and the gra points attached to each letter grade :

Grade	Qualitative Description	Grade Point
A	Excellent	10
B	Good	08
C	Fair	06
D	Marginal Pass	04
F	Fail	02